



Course Outcome Summary

Course Information: 4th Grade Science

Description: This course is about several units of study regarding Internal/External Features of Animals, Effects of Extreme Weather and Natural Disasters, Types of Energy, and Rocks and Minerals.

Instruction Level: Grade 4

Course Standards:

Energy

- Use evidence to construct an explanation relating the speed of an object to the energy of that object.
- Make observations to provide evidence that energy can be transferred from place to place by sound, light, heat, and electric current.
- Ask questions and predict outcomes about the changes in energy that occur when objects collide.
- Apply scientific ideas to design, test and refine a device that converts energy from one form to another.

Waves & Applications

- Develop a model of waves to describe patterns in terms of amplitude and wave length and how waves can cause objects to move.
- Develop a model to describe that light reflecting from objects and entering the eye allows objects to be seen.
- Generate and compare multiple solutions that use patterns to transfer information.

Molecules to Organisms: Structures and Processes

- Construct and argument that plants and animals have internal and external structures that function to support survival, growth, behavior, and reproduction.
- Use a model to describe that animals receive different types of information through their senses, process the information in their brain, and respond to the information in different ways.

Earth's Place in the Universe

- Identify evidence form patterns and rock formations and fossils in rock layers to support an explanation for changes in a landscape over time.

Earth's Systems

- Make observations and or measurements to provide evidence of the effects of weathering or the rate of erosion by water, ice, wind, or vegetation.
- Analyze and interpret data from maps to describe patterns of Earth's features.

Earth and Human Activity

- Obtain and combine information to describe that energy and fuels are derived from natural resources and their uses affect the environment.
- Generate and compare multiple solutions to reduce the impacts of natural Earth's processes on humans.

Unit

- 1. Energy**
- 2. Wave and Applications**
- 3. From Molecules to Organisms: Structures and Processes**
- 4. Earth's Place in the Universe**
- 5. Earth's Systems**
- 6. Earth and Human Activity**

Unit Outlines

1. Energy

Standards:

- Students will learn that energy can be moved from place to place by moving objects or moving it through sound, light, or electric circuits.
- Students will explain how energy affects the speed of an object.
- Students will be able to understand changes in energy when objects collide.
- Students will create an electrical circuit to transfer energy.

Essential Question:

- How can energy be changed?

Essential Knowledge:

- Energy exists in various forms
 - light
 - sound
 - heat
 - electric circuits
- Energy can be transferred from one place to another
- Vocabulary Terms
 - vibration
 - motion
 - electric circuit
 - conversion
 - reflection
 - friction

2. Wave and Applications

Standards:

- Students will learn how waves cause objects to move.
- Students will create a model to understand how light reflects from objects to enter the eye and then into the brain.
- Students will create a model to understand how sound waves travel through vibrations to the ear and then into the brain.

Essential Question:

- How do sound and light waves transfer information?
- How does water, in the form of a wave, cause objects to move?

Essential Knowledge:

- Waves exist in various forms
- Waves can be transferred from one place to another
- Vocabulary Terms
 - wave length
 - amplitude
 - wave
 - vibration
 - sound waves
 - reflection

3. From Molecules to Organisms: Structures and Processes

Standards:

- Students will explore the internal and external structures of plants and animals and how it helps them survive.
- Students will describe that animals and humans receive different types of information through their senses.

Essential Question:

- How do our internal and external features help us survive?

Essential Knowledge:

- What are the key concepts/vocabulary/ideas that students will have mastery of by the completion of the unit?
- Internal and External features support survival
- Vocabulary Terms
 - Internal
 - External
 - Growth
 - Behavior
 - Adaptation

- Ecosystem
- Senses
- Body Systems
- Plant Growth Structure

4. Unit 4 Earth's Changes Over Time

Standards:

- Students will recognize how rock layers are formed and what is found within the rock layers (eg how fossils are formed).
- Students will determine reasons of weathering and erosion.
- Students will describe how energy and fuels come from natural resources and affect the environment.

Essential Question:

- How does Earth change over time?

Essential Knowledge:

- What are the key concepts/vocabulary/ideas that students will have mastery of by the completion of the unit?
- Earth's forces change landscape
- Natural resources effect are way of life and the environment
- Vocabulary Terms
 - weathering
 - erosion
 - fossils
 - deposition
 - natural resources
 - fossil fuels
 - natural disasters

5. Unit 5 Earth's Systems

Standards:

- Students will determine reasons of weathering and erosion.
- Students will recognize how water, ice, wind, living organisms, and gravity break rocks, soils, and sediments into smaller particles and move them around.

Essential Question:

- Students will be able to answer the question(s):
 - How does weathering and erosion impact different environments in the World?

Essential Knowledge:

- What are the key concepts/vocabulary/ideas that students will have mastery of by the completion of the unit?
- Earth's forces change landscape
- Vocabulary Terms
 - weathering
 - erosion
 - fossils
 - deposition
 - natural resources
 - fossil fuels
 - natural disasters

6. Earth and Human Activity

Standards:

- Students will generate and compare multiple possible solutions to a problem based on how well each is likely to meet the criteria and constraints of the problem.
- Obtain and combine information to describe that energy and fuels are derived from natural resources and their uses affect the environment.

Essential Question:

- Students will be able to answer the question(s):
- How would the uses of technology and human interaction alter the way we use energy, fuels, and natural resources?

Essential Knowledge:

- What are the key concepts/vocabulary/ideas that students will have mastery of by the completion of the unit?
- Earth's forces change landscapes over time
- Students will explore the impacts of various natural earth processes (earthquakes, floods, tsunamis, and volcanic eruptions).